

TECHNICAL SUPPORT NOTE

Using the GUI to Configure a NetVanta 1224R/STR for Internet Access using an Ethernet Port (Cable or DSL modem)

Featuring ADTRAN OS and the Web GUI

Introduction

This Technical Support Note shows how to configure the NetVanta 1224R/STR for an Internet connection using an ethernet port. In this scenario, you will usually have a separate cable or DSL modem that will handle the WAN protocol and then provide ethernet to a port on the NetVanta.

Overview

Configuring the NetVanta 1224R/STR requires an understanding of the VLAN interface model. VLAN interfaces are used to create directly connected networks on the unit. Ports can then be defined as members of those VLANs. We will utilize VLAN interfaces to create a WAN and LAN segment for the 1224R. Next, we will add a default route and use the Firewall Wizard to setup basic Internet connection sharing (NAPT).

Step 1 – Logging into the unit.

The unit will come from the factory with an IP address of 10.10.10.1 on the default VLAN 1 interface. Set the IP address on your workstation to 10.10.10.2 with a subnet mask of 255.255.255.0 and a default gateway of 10.10.10.1. In this example, we will use the first port as our Internet access port. Make sure you have an ethernet cable attached from your workstation to any other free port on the unit. Open a web browser such as Microsoft Internet Explorer and type in 10.10.10.1 for the URL. You will be prompted for a username and password for which you should enter "admin" and "password" respectively since this is the factory default. After successfully entering the username and password, the main GUI page will be displayed.

An (Net	/anta	12249	STR	Save	Lo
d						
hary	General	System Inform	ation			
es			00.00.00.5			
	Firmware	Version	08.02.00.E			
	Part Num	ber	1200520L1			
r	Serial Nu	mher	LBADTN0413AA	287		
INS						
	System U	ptime	U days, U hours	U days, U hours, 5 minutes, 24 seconds		
	System T	ime	19:44:52 UTC			
	System D	ate	03/16/2005			
	NTD Times		(Not Configured)			
tion	NTP TIme	server	(Not Configured	0		
e	Port Sur	nmary				
ing	T OT C OUT					_
се	Status for	the NetVanta's int	erfaces.			
	Marca a	Description	1 inte	01-1-1-	March and in	
dge	Name	Description	LIIIK	State	mentuership	
vay	eth 0/1		DOWN	Disable	Default	
	eth 0/2		DOWN	Disable	Default	
	eth 0/3		DOWN	Dicable	Default	

Step 2 – Setting up the Private VLAN Interface

Click the "VLANs" link to setup the IP addresses for the unit. In the following diagrams, we will change the default IP address to 192.168.1.254. Note: When you submit the default IP address change, you will need to change your workstation IP address to match up with the new subnet and reconnect to the NetVanta using the new IP address. For example, after making the IP address change, set your workstation IP address to 192.168.1.1.

Switch
Ports
Port Security
Storm Control
Link Aggregation
VLANs 🔫
Spanning Tree
MAC Forwarding
Class of Service
Stacking

You will see the default VLAN listed with the 10.10.10.1 IP address. You can click this VLAN and change the private IP address to the private IP address you have chosen.

ADIRAN	NetVa	nta 122	24STR	Save	Logout
System					
Getting Started System Summary	¥LAN Configur	ation			
Physical Interfaces Passwords IP Services DHCP Server	Use this dialog to click on the item i default gateway it default route whe	create a new VLAN o n the list below this d f IP routing is not ena n using IP routing fun	r edit an existing ialog. Use the <u>De</u> bled on the unit. ctionality.	one. To edit an existing VLA <u>fault Gateway</u> to specify a Use the <u>Route Table</u> to add a	N, a
Hostname / DNS LLDP	Add New VLAN				
Switch		<u> </u>			
Ports		Ad	Id New VLAN		
Port Security Storm Control	Modify/Delete	ULAN			
Link Aggregation	ID Name	VLAN Type	IP Address	Mask	
VLANs	<u>1</u> Default	Static	10.10.10.1	255.255.255.0	
Spanning Tree					
MAC Forwarding					
Class of Service					
Stacking					
Router / Bridge					
Default Gateway					

Change the IP address to 192.168.1.254. After changing the default VLAN interface IP address, be sure to change your workstation IP address to match this network. For example, you could use 192.168.1.1 as your workstation IP address with a default gateway of 192.168.1.254.

		Save L
ystem	<u>YLANs</u> > "Default"	
Getting Started		
System Summary		
Physical Interfaces	VLAN Configuration for "Default"	
asswords	Use this dialog to madify the VI MI configuration. If a VI M	I name is not externel one
P Services	will be generated.	manie is not entered, one
DHCP Server		
Iostname / DNS	Enabled: 🔽	Enable or disable this
witch		VEAIV
Anten .	VI AN Name: Default	Up to 32 alphanumeric
ort Security		characters.
storm Control	LI AN INC.	Not modifiable after the
ink Aggregation	VLAN ID: 1	VLAN is created.
/LANs		This VI AN can be
Spanning Tree	VLAN Type: Static	manually configured.
MAC Forwarding		Calend this to configure
Class of Service	VLAN Interface:	this VLAN as an IP
Stacking		interlace
outer / Bridge	VI AN Interface Configuration	
Default Gateway	VLAN Interface configuration	Contract descentation (what
louting	Description:	for this port. Up to 80
toute Table		alphanumeric characters.
IP Interfaces	Foshlad: III	Enable or disable this
QOS Maps	chabled.	VLAN interface
Bridging	MAC Address: 00 : A0 : C8 : 0E : BE : A9	Media Access Control
irewall		address for this interface
Firewall Wizard	Interface Mode: IP routing 😪	Select an interface mode
Seneral Firewall		
Security Zones	IP Settings	
PN Minaud	Address Type: Static 💌	
VPN Wizaru		Enter the IP address for
Tertificates	IP Address: 192 , 168 , 1 , 234	this numbered interface
tilities		Enter the Subnet Mask
ort Mirroring	Subnet Mask: 255 , 255 , 255 , 0	for this numbered
Configuration		Puesenie OMC is used to
irmware		register this interface's
leboot Unit	Dynamic DNS: <disabled></disabled>	IP address with a DNS
elnet To Unit		Name.
	Secondary IP Settings	
	IP Address Mask	
	Add a new Secondary IP Address	1

Step 3 – Add a New VLAN for the Public Subnet (Port)

The public VLAN will be configured in one of three different modes, (A) IP Routing with a Static IP, (B) IP Routing using DHCP, or (C) PPPoE. DHCP is normally used when connected to a cable modem and PPPoE is often used when connected to a DSL modem set in pass-through or bridge mode. The following pages will show an example of each different scenario. We will use VLAN 100 for the public VLAN and 100.100.100.2/30 as the public IP address when a static IP address is used. When a static IP address is used, we need to make sure that a static default route is entered on the "Route Table" page. Add a new VLAN by clicking the "VLAN" link and then clicking the "Add a New VLAN" button.

	Ne	lvall		431 K	Save	Logout
System Getting Started System Summary Physical Interfaces Passwords IP Services DHCP Server	VLA Use th click c defau defau	N Configuration nis dialog to cru on the item in t It gateway if IF It route when u	ion eate a new VLAN o he list below this d ? routing is not ena using IP routing fun	r edit an existing (alog, Use the <u>Def</u> bled on the unit, L ctionality,	one, To edit an existing 'ault Gateway to specify Jse the <u>Route Table</u> to a	VLAN, a dd a
Hostname / DNS LLDP Switch Ports	1 bbA	New VLAN	Ac	id New VLAN	-	_
Port Security Storm Control	Modif	fy/Delete a ¥	LAN			
Link Aggregation	ID	Name	VLAN Type	IP Address	Mask	
VLANs Spanning Tree MAC Forwarding Class of Service	1	Default	Static	10.10.10.1	255.255.255.0	

Default Gateway

(Option A) - IP Routing with a Static IP Configuration. The IP address 100.100.100.2 is used as an example. The IP address information should have been provided to you by your Internet Service Provider (ISP).

ADURAN	Netvanta 1224STR	Save Loo
System System	/LANs > New Vlan	
Getting Started		
System Summary		
Physical Interfaces	VLAN Configuration for "VLAN100"	
Passwords		
IP Services	Use this dialog to modify the VLAN configuration. If a VLA will be generated	IN name is not entered, one
DHCP Server	Hin be generated.	
Hostname / DNS	Epshled:	Enable or disable this
LDP	Enabled:	VLAN
witch		Up to 32 alphanumeric
Ports	VLAN Name: VLAN100	characters.
Port Security		
Storm Control	VLAN ID: 100	in the range 1-4094
ink Aggregation		in the range 1-4094.
VLANs		Select this to configure
Spanning Tree	VLAN Interface:	this VLAN as an IP
MAC Forwarding		"Refface
Class of Service	YLAN Interface Configuration	
Stacking		Optional descriptive label
outer / Bridge	Description: Public	for this port. Up to 80
Default Gateway		alphanumeric characters.
Routing	Enabled: 🔽	Enable or disable this
Route Table		VLAN Interface
IP Interfaces	MAC Address: 00 : A0 : C8 : 0E : BE : A9	Media Access Control
QOS Maps		address for ans interface
Bridging	Interface Mode: IP routing 🚩	Select an interface mode
irewall		
Firewall Wizard	IP Settings	
General Firewall	Address Type: Static 🐱	
Security Zones		Enter the IP address for
PN	IP Address: 100 , 100 , 100 , 2	this numbered interface
VPN Wizard		Enter the Subnet Mask
VPN Peers	Subnet Mask: 255 , 255 , 255 , 252	for this numbered
Certificates		interface
tilities		Dynamic DNS is used to
Port Mirroring	Dynamic DNS: <disabled></disabled>	register this interface s IP address with a DNS
Configuration		Name.
firmware	Casendami ID Cattings	
Reboot Unit	secondary in settings	
Felnet To Unit	IP Address Mask	
	Add a new Secondary IP Address	
	Deast land	

(Option B) - IP Routing Using DHCP. This is a typical cable modem setup.

ADURAN	Netvanta 1224STR	Save Logo
ystem	<u>VLANs</u> > New Vlan	
Setting Started		
System Summary		
hysical Interfaces	VLAN Configuration for "VLAN100"	
asswords		
P Services	Use this dialog to modify the VLAN configuration. If a VLA	N name is not entered, one
HCP Server	will be generated.	
ostname / DNS	- 11 1 1	Enable or disable this
LDP	Enabled: 🔽	VLAN
vitch	1 (A)	
orts	VLAN Name: VLAN100	up to 32 alphanumeric characters
ort Security		characters.
torm Control	VLAN ID: 100	VLAN ID is any number
nk Aggregation		in the range 1-4094.
LANs		Select this to configure
panning Tree	VLAN Interface: 🔽	this VLAN as an IP
AC Forwarding		interface
lass of Service	VLAN Interface Configuration	
tacking	i interface configuration	Ontional descriptive label
outer / Bridge	Description: Public	for this port. Up to 80
efault Gateway		alphanumeric characters.
outing	Enabled:	Enable or disable this
oute Table		VLAN interface
P Interfaces	MAC Address: 00 · A0 · C8 · 0E · BE · A9	Media Access Control
OS Maps		address for this interface
ridaina	Interface Mode: IP routing 🗸	Select an interface mode
rewall		
rewall Wizard	IP Settings	
eneral Firewall	Address Type: DHCP 👽	
ecurity Zones		5 510 1
PN		Dynamic DNS is used to register this interface's
PN Wizard	Dynamic DNS: <disabled></disabled>	IP address with a DNS
PN Peers		Name.
ertificates	Secondary IP Settings	
ilities	To Address Made	
ort Mirroring	Add a new Secondary IP Address	
onfiguration	Had a new Secondary IF Address	
rmware	Reset Apply	
eboot Unit		
elnet To Unit		

(Option C) – PPPoE (ADSL modem set to pass-through mode) Set the Interface Mode to PPPoE and click "Apply". Clicking "Apply" will open a new page to set PPPoE specific settings.

ADIRAN	NetVanta 1224STR	Save Logo
System	<u>VLANs</u> > New Vlan	
Getting Started		
System Summary		
Physical Interfaces	VLAN Configuration for "VLAN100"	
Passwords		
IP Services	Use this dialog to modify the VLAN configuration. If a VLAN will be generated	name is not entered, one
DHCP Server	will be generated.	
Hostname / DNS	Frashladi 🖂	Enable or disable this
LLDP	chabled:	VLAN
Switch		Up to 32 alphanumeric
Ports	VLAN Name: VLAN100	characters.
Port Security		
Storm Control	VLAN ID: 100	VLAN ID is any number
Link Aggregation		in the range 1 4094.
VLANs		Select this to configure
Spanning Tree	VLAN Interface:	this VLAN as an IP
MAC Forwarding		incertace
Class of Service	VLAN Interface Configuration	
Stacking	1	Optional descriptive label
Router / Bridge	Description: Public	for this port. Up to 80
Default Gateway		alphanumeric characters.
Routing	Enabled: 🔽	Enable or disable this
Route Table		VLAN Interface
IP Interfaces	MAC Address: 00 : A0 : C8 : 0E : BE : A9	Media Access Control address for this interface
QOS Maps		
Bridging	Interface Mode: PPPOE	Select an interface mode
irewall		
Firewall Wizard	IP Settings	
General Firewall	Address Type: DHCP 🐱	
Security Zones		Dynamic DNS is used to
PN	Dynamic DNS: <disabled></disabled>	register this interface's
VPN Wizard	and a second	IP address with a DNS
VPN Peers		ivalite,
Certificates	Secondary IP Settings	
Itilities	IP Address Mask	
Port Mirroring	Add a new Secondary IP Address	
Configuration		
Firmware	Reset Apply	
Reboot Unit		

(Option C) – PPPoE specific settings

A username and password are required for PPPoE. Service Name and AC Name are rarely used but should be entered if provided by the ISP. Peer Authentication type should almost always be set to "None". Also, PPPoE should be set for "Negotiated" IP address unless the ISP has specified a static IP address. Whenever a static IP address is used, you will need to complete the optional step 4, which shows how to configure a static default route.

C. C	Netvan	u 122451K	Save L	
m	VLANS > "VLAN100" > P	PPoE Config		
Summary				
al Interfaces	PPPoE Configurat	ion for "ppp 2"		
ords	Basic configuration fo	r the PPP interface.		
vices				
Server	Description: P	PPoE Interface	Description label	
me / DNS			(optional)	
			Disabling this port	
1	Enabled:	2	causes data flow to stop	
· · · · · · · · · · · · · · · · · · ·			for this memade only	
acurity	MTU: 1	500	Maximum Transmit Unit	
Control			(Range 64-1520 bytes)	
ggregation	Authentication Set	tings		
	Hudichicution see	cing.		
ing Tree	Sant Uramamat	oul learn area	Enter the Username to	
orwarding	Sent Osername: Li	iyosemane	(Required)	
of Service				
ng	Sent Password: In	hyPassword	Enter the Password to send to the remote neer	
r / Bridge	Selic Passificial [(Required)	
t Gateway				
g T-11-	Service Name:		If your provider does pot require a Service	
i able			Name, leave it blank.	
lane			If your providers does	
iaps	AC Name:		not require an AC Name,	
all			leave it blank.	
ll Wizard	Peer		Authentication type used	
al Firewall	Authentication M	lone 💌	when authenticating	
ty Zones	Type:		remote peers	
			Feer Username (s	
izard	Peer Usernamen		required when the	
iers			authenticate to this unit	
cates				
15	Peer Password.		Password received from the remote pers	
rroring	provide and the contract of th		100+74+0009+195-01-	
uration	IP Settings			
are .	Address Type: N	enotiated v		
To Unit	Houress Type: In	a Anama ana	all of here is	
To Unit	Default Route: 🔽	1	Add a default route to the route table.	
			Dynamic DNS is used to	
	Dynamic DNS:	disabled >	register this interface's	
	e ynanne blaar is		IP address with a DNS	
			manne.	
	Secondary IP Settin	ngs		
	IP Address	Mask		

Step 4 – Adding a Default Route when using a Static IP Address

This step is not required when learning a default route dynamically as in step 3 (option B) when we used DHCP. You need to add a static default route when using IP Routing with a static IP address or PPPoE with a static IP address. Click the "Route Table" link and then add a static default route by specifying the destination network and subnet mask as 0.0.0.0. In our example, the static IP address assigned to us by our ISP is 100.100.100.2 and the default route gateway IP address set below is 100.100.100.1.

		Save Logou
ystem		
etting Started		
ystem Summary	Add a Static Route to the Route Table	
hysical Interfaces		
asswords	Static Routes are often required to reach network	ks that are not learned via a dynamic
P Services	routing protocol. Enter the appropriate informatio	on below to add a static route or click
HCP Server	on a route below to use it as a template for a new	w route.
lostname / DNS	Destination Company Company	Epter the petwork to add to the
LDP	Address: 0 , 0 , 0 , 0	route table.
witch		Enter the appropriate much for
orts	Destination Mask: 0 , 0 , 0 , 0	this network.
ort Security		
torm Control	Gateway:	
ink Aggregation		Enter the gateway address to
LANS	Address 100, 100, 100, 1	reach this network.
panning Tree		- OR - Select the interface to be used
IAC Forwarding	🔾 Interface 🛛 < Select Interface > 😒	as the gateway.
lass of Service	• • · · · · · • • · · · ·	
tacking	Distance	The Distance metric for this
outer / Bridge	(optional):	network. (Optional parameter)
efault Gateway		
outing	Reset	.dd
oute Table	View/Delete Static Route	
P Interfaces	Click on the name of a route to use it as a templa	ate for a new route.
20S Maps	Destination Mask Next Hor	D Dist Type
ridging	There are no entries in t	he route table.

Step 5 – Assign an Ethernet Port to be a member of the Public VLAN

In the example below, we are setting the first Ethernet port as a member of VLAN 100 and setting it to "edgeport" mode to allow this port to come up immediately. This port should be plugged into your Internet connection. Make sure your workstation is not plugged into this port and remember to click the "Apply" button. Also, it is probably a good idea after making this change to click the "Save" button to save the configuration in nonvolatile memory.

ADIRAN	Net	Vant	a 1224S	TR	Save	Logout
System Getting Started System Summary Physical Interfaces Passwords ID Services	Switch Por Make changes	rts Configurati	ion port's settings and click :	Apply. Click on the n	ame of the p	port to
DHCP Server Hostname / DNS LLDP	configure addit	tional port settin <u>Deselect All</u>	gs and view port statistic	s.	Reset	Apply
Switch	Port	Edge Port Mode	Membership 🕜	Speed/Duplex	Status	STP 🕐
Port Security Storm Control	Template 🕜 Line	<select> 💟</select>	<select></select>	<select> 💌</select>		
Link Aggregation	<u>eth 0/1</u>	Enabled 💌	vlan 100(VLAN100) 💙	Auto 💌	100/Full	Forwarding
Spanning Tree	eth 0/2	Disabled 💌	vlan 1(Default) 🛛 💌	Auto 💌	100/Full	Forwarding
MAC Forwarding	<u>eth 0/3</u>	Disabled 💌	vlan 1(Default) 🛛 🔽	Auto 💌	Down	
Stacking	<u>eth 0/4</u>	Disabled 💌	vlan 1(Default) 🛛 💌	Auto 💌	Down	
Router / Bridge Default Gateway	eth 0/5	Disabled 💌	vlan 1(Default)	Auto 💌	Down	
Routing Route Table	eth 0/6	Disabled 💌	vlan 1(Default) 🛛 👻	Auto	Down	
IP Interfaces	eth 0/7	Disabled 💌	vlan 1(Default)	Auto 💌	Down	
QOS Maps Bridging	eth 0/8	Disabled 💌	vlan 1(Default) 🗸	Auto	Down	
-irewall	eth 0/9	Disabled 💌	vlan 1(Default)	Auto	Down	
General Firewall	eth 0/10	Disabled 💌	vlan 1(Default)	Auto	Down	

Step 6 – Using the Firewall Wizard to Setup Internet Connection Sharing (NAPT)

We will use the Firewall Wizard to setup the "Security Zones" on the router. You can also setup some basic port forwarding using this wizard. Note: You only want to use this wizard for the initial configuration. All future firewall settings should be added using the "Security Zones" link.



Step 6-1. The first wizard page is just a warning that this will overwrite any previous firewall settings.

🖄 http://10.10.10.1 - Firewall Wizard	🗖 🗖 📈
Firewall Wizard	
The Firewall Wizard will allow you to perform a basic configur firewall.	ation of your
The settings selected in this wizard will overwrite any p firewall configuration and will interrupt all network tr through the NetVanta.	revious affic routed
Click Next to continue.	
Cancel Next >	
🕙 Done 🔹 🔮 Inte	ernet

Step 6-2. Select the public VLAN interface. In our example, this is VLAN 100.

🖄 http://10.10.10.1 - Firewall Wizard - Public Interface 🛛 🛄 🗖 🔯
Public Interface - Firewall Wizard
Switch
Local Network NetVanta 1224STR
In order to begin configuration of your firewall the wizard must know which interface is connected to the Internet.
Which interface is connected to the Internet?
Interface: 🚺 vlan 100 (VLAN100). 🗸
< Back Next >
🕙 Done 🤍 🔮 Internet

Step 6-3. This step will allow you to setup some basic port forwarding. Port forwarding can be done at a later date by adding policies to the "Public" Security Zone.

🗿 http://10.10.10.1 - Firewall Wizard - Private Servers 🛛 🚬 🗖	
Private Servers- Firewall Wizard	
Switch	
Local Server	
Are there any servers on your private network that Internet users need to be able to access? The NetVanta will only allow specific traffic into your private network to help protect your servers.	
No, I don't have any servers that need to be accessed from the Internet.	
 Yes, I need to provide access to the following kind of server: Web server FTP server E-mail server Telnet server Other server 	
<pre>Sack Next ></pre>	
🖹 Done 🧳 Internet	

Step 6-4. The final step is to confirm that the default VLAN 1 will share the IP address applied to the public VLAN 100.

🖄 http://10.10.10.1 - Firewall Wizard - Summary 🛛 👘 🔀
Summary - Firewall Wizard
Based on your selections, your firewall will be configured as follows:
Internet Connection Sharing Enabled All Internet access from the interfaces listed below will share the IP address 100.100.100.2 from the public interface "vlan 100"
Private Interface Description
vlan 1 Default
Port Forwarding There are no servers selected that will be accessible from the internet.
WARNING: Clicking the apply button will overwrite your current firewall settings with the settings shown above.
< Back Apply Cancel
🕘 Done 🔮 Internet

Step 7 – Save Your Changes

The basic configuration should be complete after using the Firewall Wizard. Be sure to click "Save" after you make any configuration changes. This will ensure that the configuration will be maintained in the unit by storing it in the NVRAM.

ADIRAN	Net\	/anta	1224S	TR	Save	10000	
vstem					0010	- Logoa	
Getting Started							
System Summary	Conoral	Sustam Inform	ation				
hysical Interfaces	General	System Inform	ation				
asswords	Firmware	Firmware Version		08.02.00.E			
9 Services	Part Num	Part Number		120052011			
HCP Server	T di Cittani	Fart Number		120032021			
ostname / DNS	Serial Nu	nber	LBADTN0413AA287				
.DP	System U	System Uptime		0 days, 6 hours, 44 minutes, 57 seconds			
vitch	Suctor T	System Time		15:40:10 UTC			
orts	<u>system n</u>	system time		15:40:10 01C			
rt Security	System D	System Date		03/17/2005			
orm Control	NTP Time	NTP Time Server		(Not Configured)			
nk Aggregation							
LANs							
panning Tree	Port Sun	nmary					
C Forwarding						_	
ass of Service	Status for	the NetVanta's int	ertaces.				
uter / Bridge	Name	Description	Link	State	Membership		
fault Gateway	eth 0/1		UP	Forward	VLAN100		
uting	eth 0/2		HP	Forward	Default		
ute Table	out of 2			- i iii			
interfaces	eth 0/3		DOWN	Disable	Default		
S Maps	eth 0/4		DOWN	Disable	Default		
dging	eth 0/5		DOWN	Disable	Default		
ewall	ath 0/C		DOWN	Disable	Default		
ewall wizard	ech 0/6		DUWN	Disable	Derault		
neral rirewall	eth 0/7		DOWN	Disable	Default		
Curry Zones							

Step 8 – Consult Additional Documentation

Additional Documentation is available at <u>www.adtran.com</u> using the "Service/Support" link or doing a search for "ADTRAN OS Web GUI". There you can find an introduction document for each menu. If you experience any problems with your ADTRAN product, please contact Technical Support at 888-423-8726.

DISCLAIMER

ADTRAN provides the foregoing application description solely for the reader's consideration and study, and without any representation or suggestion that the foregoing application is or may be free from claims of third parties for infringement of intellectual property rights, including but not limited to, direct and contributory infringement as well as for active inducement to infringe. In addition, the reader's attention is drawn to the following disclaimer with regard to the reader's use of the foregoing material in products and/or systems. That is:

ADTRAN SPECIFICALLY DISCLAIMS ALL WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL ADTRAN BE LIABLE FOR ANY LOSS OR DAMAGE, AND FOR PERSONAL INJURY, INCLUDING BUT NOT LIMITED TO, COMPENSATORY, SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR OTHER DAMAGES.